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Bivariate Generalization of q-α-Bernstein Polynomials

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Abstract : We propose to define the q-analogue of the α-Bernstein Kantorovich operators and then introduce the q-bivariate generalization of these operators to study the approximation of functions of two variables. We obtain the rate of convergence of these bivariate operators by means of the total modulus of continuity, partial modulus of continuity and the Peetre's K-functional for continuous functions. Further, in order to study the approximation of functions of two variables in a space bigger than the space of continuous functions, i.e. Bögel space; the GBS (Generalized Boolean Sum) of the q-bivariate operators is considered and degree of approximation is discussed for the Bögel continuous and Bögel differentiable functions with the aid of the Lipschitz class and the mixed modulus of smoothness.

Keywords : Bögel continuous, Bögel differentiable, generalized Boolean sum, K-functional, mixed modulus of smoothness
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